CHAPTER 8

Vegetation Management

Boy Scouts at camp on Payette Lake. Photo courtesy of Idaho State Historical Society.

VEGETATION MANAGEMENT AT PONDEROSA STATE PARK

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Introduction

Forest management involves the use of forests to meet the objectives of landowners and society. While the objectives may change and the means to reach them become sophisticated, forest management still is the attempt to guide forests toward a society's goals.

A forest manager is the catalyst of this effort and, as such, needs the earthy and intimate understanding of a botanist, the long-range viewpoint of a planner, the skills of an administrator, and the alertness, flexibility, and all-around resourcefulness of a successful business executive. Above all, the forest manager requires a genuine sense and feeling for the forest as an entity. Every forest offers a real and living individuality. Recognizing this uniqueness while applying the principles of management is the heart of forest management. (Davis and Johnson, 1987).

It is necessary for private and especially public land managers to consider all timber-management decisions in the context of a larger. socially defined, multiple-use management framework.

A quantitative justification that management recommendations, decisions, and plans will satisfy owner constraints and that they are the best of the alternative choices is also needed for sound management of forests. (Davis and Johnson, 1987).

Under strictly natural conditions, a forest is generally a self-perpetuating system that does not require management. It goes on indefinitely in one form or another, but it can be modified and changed in many ways. Decisions made and actions taken now may have effects and consequences felt many decades into the future. A high degree of responsibility and stewardship is essential.

The evolution of a forest is a complex process. It involves establishment of young individuals of pioneer species (first stage of a plant community's ecological development), growth and replacement by other species through a complex set of interactions that form the basis of the science of ecology. This ecological development is called succession.

Silviculture

Through the practice of silviculture—the care and management of forests—many people may affect the succession of a forest. Their treatment may be designed to maintain the status quo, speed succession, or set it back to an earlier stage. A planting may speed the succession by establishing a species that is characteristic of later stages while selective harvesting of scattered trees will maintain a mature stand's

structure and composition without allowing succession to proceed to an mature or climax forest.

A silvicultural system is simply the method selected to grow and reproduce the forest in a way that combines the biological needs of the species and the personal objectives of the owner. Unfortunately, the biological needs sometimes take a back seat to the owner's objectives.

The main purpose for which a particular tract of forested land is managed is determined by the ownership and the economic situation in which it must be operated. Forested lands are generally managed for a multitude of purposes, with one dominant use. A forested land can often be managed simultaneously for several uses and management of the whole is directed to achieve the greatest total benefit and value. In some cases, however, uses are incompatible with one another and the lesser must be subordinated to the more dominant. Recreation is an example that is so strongly a dominant use that timber cutting, grazing and hunting must be reduced.

Since the GDP classifies Ponderosa State Park as a natural park, its forest is to be managed as a natural forest. Although decisions to manage it this way may affect other uses, this predominant management direction must not vary. But again, any management decisions directed to enhance a natural forest can affect other uses of the forest.

Goals and Objectives

To achieve the overall forest management directives, goals and objectives are established. These, in conjunction with existing IDPR policies, give long-term direction to the vegetation management plan.

GOALS:

The primary goal for natural resource management in Idaho State Parks include:

•Sustaining unique ecological communities.

•Restoring ecological processes as they would function without the influence of humans.

•Protecting air and water quality.

•Maintaining an aesthetically appealing environment.

OBJECTIVES:

•To maintain the forest's naturally aesthetic setting, but reduce the potential for a catastrophic fire.

•To identify forest concerns and management alternatives to correct them.

•To restore fire as a natural process to maintain the parks ecosystems.

•To protect the park's watersheds.

•To have the forest management plan as an integral part of the park's overall management plan and forest management practices interpreted for the public's understanding and knowledge.

Timber-Management Policy

IDPR has adopted a policy which gives general outlines and direction for all forests within state parks. This policy sets the tone for Ponderosa State Park's Vegetation Management Plan. The policy reads:

PAR. 5:73 - TIMBER-MANAGEMENT POLICY ON STATE PARKLANDS-Trees individually or combined in groves or major stands contribute to the scenic and aesthetic values of a recreation area. A tree of 12 inches or more in diameter represents a major investment and cannot be replaced generally, except by an investment in time. For these reasons, our objective will be to retain the individual trees and various stands of timber in as near a natural state as possible, including snags that are important to cavity-nesting birds.

A. Each tree considered for removal will be judged on its own merits.

B. Safety of the recreating public will be a major concern and any tree, because of physical condition or location that creates a human hazard will be removed.

C. Damage to the rest of the stand through disease or insect infestation shall be sufficient cause for the removal of the infected trees.

D. Infestations dangerous to the residual stand, but capable of treatment without the loss of the tree, will be treated by the park staff or in widespread situations, as a cooperator with other timber groups.

E. Fire-killed and blow-down timber usually involves a considerable amount of timber and frequently becomes a source of damage by insects and disease to the rest of the stand. Trees of considerable volume will generally be salvaged both for the protection of the stand and for the monetary value they represent. Isolated trees that do not represent a hazard to the remaining stand may be left if it is not aesthetically undesirable and if the cost of removal is excessive. Fire-killed and blow-down material should be salvaged when advisable at the earliest opportunity to retain as much of the quality of the timber as possible.

F. Trees may be removed from right-of-way clearings or other construction areas requiring open space. Considerable care will be exercised to limit the damage to the remaining trees. Only those trees will be removed which will be essential to the development.

G. Layout plans will give full consideration to saving unusual, historical or other trees significantly important, aesthetically, to the park area.

H. Under special circumstances, timber may be cut and harvested to reestablish an essential game range, to establish or preserve a spectacular view, to retain a desirable species, or to change the type to a species more suitable for park needs.

I. Under no circumstances will the commercial value of a tree within the park be considered as criteria for its removal.

J. Salvage material from the trees removed under the above policy may be sold by the department in accordance with established procedure.

FOREST SUCCESSION

In the last 70 years, natural succession of the forest has been altered In altering this succession, many changes have taken place at Ponderosa State Park regarding to climatic timber types, habitat types and soil physical class. In eliminating fire as a natural occurrence, ponderosa pine and Douglas fir, both climatic species in years past, have now begun to be replaced by white fir, high brush and serial species. Seed beds necessary for the regeneration of ponderosa pine, Douglas fir and other species have been altered allowing old growth timber canopies and high brush to exist, and insect and diseased species to propagate. The percentage of species infected or destroyed by insect and disease has increased since 1920. Allowing infected and dead species to exist with healthy species will only increase the percent of loss by insect and disease. Allowing dead trees to deteriorate naturally increases fuel loading which, in turn, creates an extreme fire potential in the park.

Insects

Insects are a more destructive force in forests than wildfire. Unlike the spectacular destruction of fire, insect damage is slower and the damage is less evident - until the insects become so numerous that an epidemic ensues.

A primary determinant of insect population levels is the availability and condition of food - that is, species composition and stand structure are influencing factors on the population growth of insects. As a general rule, forests with the greatest diversity of tree species are more resistant to outbreaks of forest insects.

Control Alternatives

The decision to control insects must be based on a comprehensive review of all factors bearing on the management of the forest. Ecological, sociological, and economic implications must be weighed carefully. The use of silviculture methods for controlling pests is preventive instead of corrective and the effect may be reflected some years beyond the time after the practice is initiated. For example, the western pine beetle, a problem among mature trees and those of less vigor, is controlled by thinning. Low vigor, thin-crowned and over-mature pines that are likely to become infested by the beetle may best be managed by a special cut to thin them.

Chemical Control

The application of chemical insecticides in the forest is an emergency undertaking designed to reduce damage immediately. If properly planned and carefully executed, application of the pesticide should have a negligible effect on the environment. The habits of the pest species, the area involved, the proximity of water and the poten-

tial for adverse impact on area wildlife all must be taken into account when consideringif, which, when, how and how much pesticide is to be applied. The consequences are often felt for many years afterward.

Novel Chemical Approaches

Among the chemicals available for forest pest control are several that exploit an insect's particular biological characteristics. Many of the insect species' males are attracted to the female of the species by a particular identifying odor of a chemical substance that is secreted by the female called a pheromone. Chemists have synthesized this pheromone and it is used to lure the males into areas which are to be cut and, therefore, away from areas not to be cut. There are also repellent pheromones which work by telling the Insects there is already an over population and they need to go elsewhere.

There are several other novel chemicals and many more are being developed. Each must be carefully examined for their impact on target insects and on the flora and fauna of the entire forest ecosystem.

Forest Diseases

Although insects cause the highest mortality loss of trees, by far the largest growth losses are a result of tree diseases. The health of forest trees is affected by a number of factors that subject trees to stress. At any point in time several stress factors may operate concurrently so that the health of a tree may be determined by the total effect of all stresses.

Forest trees are subject to disease caused by adverse environmental influences and by a variety of destructive agents. Disease can be defined as a malfunction of a metabolic process, or a disturbance of normal structure.

Factors causing diseases in forest trees are classed as abiotic (noninfectious, nonparasitic) or biotic (infectious, parasitic). A number of abiotic agents, including moisture and temperature extremes, can cause disease in trees. Nutrient excess or deficiency and toxic substances in the air or soil also are abiotic agents. Diseases caused by abiotic agents often are difficult to diagnose because the causal agent is no longer present, or because the cause-and-effect relationship is difficult to establish.

Most forest-tree diseases are caused by various biotic agents. These include viruses, mycoplasmas, bacteria, fungi, parasitic higher plant, and nematodes. Of these, the fungi causes the greatest number of diseases, as well as the greatest total loss. Fungi are usually classified as plants without chlorophyll and with a very simple structure undifferentiated into stems, leaves, and roots.

Forest Disease Management

The management objectives for forest disease must first depend on the objectives of the managing agencies and the use of the forest. The control of a disease might be undertaken only when a significant impact is obvious with the forests' objectives. The reduc-

tion of root- diseases is a formidable task because of the difficulties in diagnosis of root disease and in determining the complex relationships among rootpathogens, the tree host, and the soil environment.

Most methods for control of forest diseases are preventative in nature and may include alternative species selection, burning or thinning. As noted earlier, fire is known to directly inhibit certain pathogens.

Forest-Wildlife Interactions

Forests provide the basic habitat for a large proportion of the world's wildlife, including amphibians, reptiles, birds and mammals. Trees provide food and protection from the weather and from other animals. Forests also have a stabilizing effect on stream flow that provides fish habitats. Taken together, these elements constitute wildlife habitat, which may be a specific forest type or a mixed forest. Within habitats, each species of wildlife uses a particular portion, or its niche. The ecological niche of an organism depends not only on where it lives, but also on what it does.

The relationship between forest and wildlife is so intertwined and complex that little can be done to a forest that does not have impact on some form of wildlife. One obvious impact is the effect from clear-cutting or burning a forest. The habitat of some animals can be harmed - cover is removed, nesting or denting sites are damaged, and seed or fruit producing trees are destroyed.

There is also an impact on wildlife populations when a forest is allowed to proceed toward climax through normal succession. The large herbivorous species dependent on low-growing plant forms diminished and are replaced by a greater diversity of smaller animals.

Thus the concept of what is "good" and "bad" forest management for wildlife depends on the situation. A practice bad for one group of species may be good for others.

A large proportion of forest wildlife depends on the periodic destruction and renewal of the forest for survival. Allowing forest land to proceed toward climax usually causes the loss of plants that provide the bulk of wildlife food and shelter. A forest manager should follow the advice of Aldo Leopold, who stated, "A good tinkerer saves all the pieces."

Recommendations

It must first be realized that the vegetation management plan and the following recommendations are presented as a general guideline for the management direction Ponderosa State Park's forest is to take. For each management directive, such as insect control, a detailed investigation will be required to determine the most appropriate means to reach a particular end. Recommended methods to reach a management directive will vary as determined by the location and use intensity of a particular area, as well as the economic feasibility.

The park management has worked closely with the University of Idaho, College of Forestry, and Wildlife Range Sciences in the past to determine detailed control and management methods, and it is recommended that this close working relationship continue. Cooperationwill also be maintained with the U. S. Forest Service, Department of Lands, and Fish and Game.

The park's natural status and the department's policies have predetermined that the forest is to be managed as a natural area, therefore, uses such as wildlife habitat improvement are encouraged. IDPR timber management policy also states that the commercial value of a tree will not be a criteria for removal and, therefore, no commercial timber cutting for purely economical gains shall be allowed.

REFORESTATION

The planting of trees for reforestation in the park is a recommended management practice. Ponderosa's Natural Resource plan has identified areas in the park suitable for tree planting that will help achieve our overall goals.

Insects, Disease, and Wildlife

Insects and fungi are an integral part of the forest ecosystem as are the various animal and plant species. Their role appears to be essential in the regulation of forest bamboos and in recycling the components of woody vegetation back to the soil. While insects and forest pathogens perform these vital recycling functions, they can present many problems to humans in the management of forests, especially if the forest is a major component of a park. Since Ponderosa State Park is to be managed as a Natural Park, insects and diseases will be managed accordingly.

The major insect pests are the Douglas fir beetle, the mountain pine beetle and the western pine beetle. Control of stand density and the control of species composition are the two major means of keeping populations of these insects within acceptable levels. The loss of some trees while these insect populations are at endemic levels is expected and natural. Epidemic populations and catastrophic tree losses can also be expected, but these levels of loss are not acceptable even though they are natural. The goal in the management of this park is to carefully manipulate the forest species composition and density to maintain a healthy forest. Prescribed fire can be used as a natural management tool to accomplish a majority of the stand management prescriptions.

The careful application of selective thinning of stands before they reach the high-risk stage is recommended. The application of group selection harvest to break up the uniform stands and increase the age and species diversity will not only create a more stable forest ecosystem, but will be beneficial to the park's wildlife population.

A detailed inventory of the park's vegetation and wildlife population is required to assess problems and opportunities and to prioritize management activities.

Hazardous Trees

A hazardous tree is any tree that has a structural defect that, if it falls, may result in property damage or personal injury. For thedepartment to protect itself from liabilities, it is necessary to use reasonable care to protect the park's visitors. In most cases, reasonable care implies that campgrounds, picnic areas, and trails have been evaluated for safety hazards by professionals. The best protection against liability is an annual inspection of these use areas. Park management has been very aggressive in the removal of hazardous trees in the past and this aggression should continue in the future. Hazardous trees should be removed prior to the use season.

BRINGING THE PONDEROSAS BACK TO PONDEROSA STATE PARK

Franklin E. Boteler

Ponderosa State Park is recognized as one of Idaho's "crown jewels." Lying on the edge of scenic Payette Lake in mountainous central Idaho, the park is noted for its stately old growth ponderosa pine trees. Those pines are now in danger. Without careful management, they will not be there for future generations to enjoy.

In order to maintain the unique values Ponderosa State Park was established to protect, the park is implementing a natural resource management plan. The primary goals for natural resource management in Idaho state parks include sustaining unique natural communities, restoring ecological processes as they would function without the influence of humans, enhancing water and air quality, providing wildlife viewing opportunities and providing an aesthetically pleasing environment.

Before human intervention, nature provided lightning-caused, low level fires that served an important function in supporting the unique natural communities which typically characterize state parks. Studies of tree ring growth in Ponderosa State Park, indicate most of the park was burned over by low level fires every five to ten years before humans began to tamper with the process. These fires created conditions which favored the regeneration and sustenance of the stately ponderosa pines. The species commonly forms open park-like forests, grows 180 feet high, and has a four-foot diameter. Reproduction is best in clearings made by fire.

The following "unnatural effects" can be seen in the park as a result of suppressing natural fire:

° The understory (small trees, bushes and plants) has flourished creating unnatural conditions which no longer favor ponderosa pine regeneration. Natural communities dependent on the ponderosa pine are being replaced by fir and lodgepole pine. Ponderosa pine regeneration is not occurring within the park.

° The unnaturally heavy understory out-competes the overstory (large trees) for limited water and nutrients, thereby increasing stress on the overstory trees making them more susceptible to wind-throw, insect infestation, and disease than they would be if nature had taken its course. The overstressed ponderosa pines are not producing seed cones.

° The heavy understory becomes "ladder fuel," which leads fire up into the lower branches of the overstory, greatly increasing the probability that destructive, high intensity fires will result. In some recent cases in Idaho, these crown fires have become so hot the top layer of soil "melted" into a waxy layer relatively impervious to water, air and nutrient cycling. Such unnaturally large and hot fires also pose a threat to public safety.

° In places within the park, unique natural communities, such as the "Lily Marsh"and the open field at the park entrance, will be replaced by forest unless management practices are implemented to maintain them. If these habitats are replaced, there will be a significant decline in the variety of bird species which populate the park.

In order to simulate the natural process, prescribed burns will be conducted at Ponderosa under very controlled conditions. Before conducting a burn, a plan will be developed identifying ecological objectives for the burn, desired atmospheric conditions for conducting the burn, equipment need, and crew responsibilities. These low volume burns seldom reach over three feet in height. They are administered by a trained fire crew in the spring or fall when vegetation moisture, relative humidity (25 to 50%), and winds (consistently 5-10 mph from one direction) are appropriate. In park settings, the fires are also carefully administered to retain all snags, buffer all known raptor nest sites, and avoid nesting or reproduction seasons. Infiltration zones are left between the treated area and water resources in order to preserve water quality. If necessary, ladder fuels are mechanically removed before the fire treatment to avoid risk of fire reaching the overstory.

This spring, a fire crew will be kept on alert status by the park manager. When atmospheric conditions are appropriate, the crew will be called in to begin implementing the fire plan by setting very small backfires proximate to the fire break or border (typically a road). Once the break area is adequately "blacked out" to prevent any fire spread, the crew moves upwind and sets small fires, tracking them through the forest until they naturally decline upon hitting the firebreak. The fire is managed so that flames will not reach the overstory. Adequate crew and equipment are maintained to extinguish the fire should environmental conditions change.

Through implementing a prescribed burn program, natural conditions will be simulated in the park. Over time, this should reestablish the ecological processes which existed before humans intervened. In this way, the significant natural communities protected by Ponderosa State Park will be sustained for future generations to enjoy.